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ABSTRACT

A classification task with two experimental conditions, a visual presentation mode and a verbal presentation mode, was presented to 20 adult subjects and to 108 children, ages 3 years, 9 months to 7 years, 2 months. Among children, verbal presentation elicited a significantly greater number of accurate functional classifications than did the visual presentation. Adults performed equally in the two modes. Children were more likely to respond with a categorical or classification label when presented with verbal word pairs than when shown two pictures of the same pair of items. The implications of this finding for developmental studies, assessment, and treatment are addressed. (Author/RH)

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CLASSIFICATION SKILLS: VISUAL AND VERBAL PRESENTATION MODES

Presented in Washington, DC
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Speech-Language-Hearing
Association

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ABSTRACT

A classification task with two experimental conditions, a visual presentation mode and a verbal presentation mode, was presented to 108 children, ages 3-9 years to 7-2 years and 20 adult subjects. Verbal presentation elicited a significantly greater number of accurate functional classifications than did the visual presentation for children while adults performed equally on the two modes. Children are more likely to respond with a categorical or classification label when presented with verbal word pairs than when shown two pictures of the same pair of items. The implications of this finding for developmental studies, assessment, and treatment are addressed.

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This investigation examined the performances of 108 subjects, ages 3-9 years to 7-2 years, and 20 adult subjects on a classification task with two stimulus conditions, a visual presentation mode and a verbal presentation mode. The study was based on prior research by Olver and Hornsby (1966), Brunner and his colleagues (Olver and Brunner, 1973), and Bailey (1983). The Olver investigations found differences in classification responses attributable to presentation mode for subjects, 6 to 19 years of age, with responses based on perceptual attributes more frequent with pictoral materials than with written words (Olver and Hornsby, 1966). Bailey (1983) found that preschool children gave functional classifications more frequently when verbal word pairs were presented than when picture pairs were presented. Further investigation is justified because classification skills serve a role in language development and are important for treatment of language handicapped children.

METHODOLOGY

Nonhandicapped children, ages 3-9 years through 7-2 years, were selected from a university day care center and three elementary schools. There were 108 subjects, 59 females and 49 males, 85 white subjects and 23 black subjects. Twenty adults served as a control

group. All subjects were administered 18 pairs of items under two experimental conditions, a visual presentation mode (picture pairs) and a verbal presentation mode (word pairs). Stimuli from the iconic/symbolic subtest of the Muma Assessment Program (Muma & Muma, 1979) were selected for the item pairs. Experimental tasks were presented in alternate order to minimize order of presentation effects. Following a training procedure, each subject was asked to tell "how the items go together." An accurate functional classification response was one that described a shared function or provided the category label for the pair.

RESULTS

Data were tested for differences between presentation modes for both children and adults with a t test for matched pairs, and correlations between ages and scores for the children were computed. Responses were inspected further by sex, race, and for the oldest 24 subjects and youngest 24 subjects (Table 1). Descriptive data regarding both functional and nonfunctional responses were gathered and chartered.

> The null hypothesis that there are no differences in frequency of functional classification responses between a visual presentation mode and a verbal presentation mode for 108 subjects, 3-9 years to 7-2 years, *was rejected* based on an obtained t value of -8.439 (df 107) at a significance level of .05 (one-tail).

> The null hypothesis that there are no differences between frequency of functional responses between a visual presentation mode and a verbal presentation mode for 20 adult subjects *was not rejected* based on an obtained t value of 1.72 (df 19) at a significance level of .05.

A *Pearson product-moment correlation coefficient* computed for age and functional classification responses for the *visual presentation mode* yielded an r value of + .73 indicating a strong correlation between responses and age of subjects.

A *Pearson product-moment correlation coefficient* computed for age and functional classification responses on the *verbal presentation mode* yielded an r value of + .44 indicating a moderate degree of correlation between responses and the ages of subjects.

The oldest 24 subjects ($\bar{X}$ age = 6-8 years) and the youngest 24 subjects ($\bar{X}$ age = 4-1 years) were identified. A t test was computed for each of these two groups comparing responses from the verbal presentation mode with responses from the visual presentation mode. Significant differences ($p < .05$) were found for both groups with a t value of -2.352 (df 23) for the older 24 subjects and a t value of -6.013 (df 23) for the younger 24 subjects (Table 1). The difference found for the group of 108 subjects was found for these two subgroups, also.

A comparison was made for the female subjects as a group, the male subjects as a group, for the white subjects as a group and the black subjects as a group. In each instance the t values were significant: female subjects, -6.2 (df 58); male subjects, -5.663 (df 48); white subjects, -6.748 (df 84) and black subjects, -2.868 (df 22) (Table 1). Four additional statistical procedures were performed. The comparisons were between groups of subjects by sex and race within each of the presentation modes. No differences were found for race or sex within the visual presentation mode or within the verbal presentation mode (Table 1). These data indicate that the differences found in this study were not attributable to race or sex.

When classification responses of the adults are charted with the responses of the children of this study (even the older children) were not utilizing symbolic classifications with great frequency. Common attributes were cited more frequently by the younger children. Relational categorizations, thematic groupings, and association complexes were present (Olver and Brunner, 1973) demonstrating emerging skills in various forms of classification. Table 2 includes examples of responses.

CONCLUSION

The visual presentation mode yielded fewer functional classification responses than did the verbal presentation mode because the children tended to utilize classifications based on visual perceptual attributes. Differences found in this study were not due to race or sex. The correlations between age and functional classification responses, whether with visual or verbal stimuli, indicates that the ability to express functional classification is an age related behavior. An analysis of responses by item pairs showed emerging forms of adult classifications. However, the older children did not match the adult subjects in stating symbolic relations between items.

The importance of the methodology by which classification skills are studied, particularly mode of presentation, is documented by this investigation. Utilization of visual materials, whether sorting tasks or pictures, appears to yield different response patterns than use of verbal stimulus items. Another issue to

consider is that treatment programs teaching functional classifications to language handicapped children may not be facilitating the acquisition of functional classifications when visual stimuli primarily are used. This investigation indicated that verbal presentation modes are more likely to yield relational classifications than visual presentation modes. The data give support for importance of oral language in cognitive development.

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TABLE 1. Summary of statistical tests for classification responses between modes of presentation for subjects by group, age, sex, and race.

Comparisons	*t* value	*df*	significance level
verbal with visual stimuli (n=108)	-8.439	107	.001
verbal with visual stimuli oldest 24 subjects	-2.352	23	.028
verbal with visual stimuli youngest 24 subjects	-6.013	23	.001
verbal with visual stimuli female subjects (n=59)	-6.2	58	.001
verbal with visual stimuli male subjects (n=49)	-5.663	48	.001
verbal with visual stimuli white subjects (n=85)	-6.748	84	.001
verbal with visual stimuli black subjects (n=23)	-2.868	22	.009
female with male subjects visual stimuli	-0.2763	106	NS
female with male subjects verbal stimuli	-0.4932	106	NS
white with black subjects visual stimuli	-0.3035	106	NS
white with black subjects verbal stimuli	-0.3073	106	NS

TABLE 2. Examples of responses by adults and children for item pairs from the verbal presentation mode.

Item Pairs	Adult Responses	Child Responses
lamp and flashlight	lights	they light turn on so you can see
bicycle and car	transportation	can ride in them both go
drum and guitar	musical instruments	instruments can play them
bird and airplane	both fly	fly have wings
bed and stool	furniture	you can sit on them they have four legs
truck and wagon	transport goods toys for children	put stuff in them both toys
comb and toothbrush	toilet articles	use in bathroom brush with them
tree and flower	plants	both grow you pick them
shoe and shirt	articles of clothing	wear them put them on
pencil and scissors	school supplies tools used with hand	write and cut school stuff